it into the consistency of mortar, will, when applied to its purpose, make a compact and durable artificial stone, equal to the Portland stone itself.

To JAMES RUSSEL, *of Wednesbury, in the County of Stafford, Gas Tube Manufacturer, for his invention of an improvement in the manufacture of Tubes for Gas and other purposes.*

These improvements, appertain to the peculiar mode of forming pipes and tubes of malleable iron, as practised by the patentee. He states, that he provides iron plates, previously rolled to a suitable thickness, and cut into strips of such length, as may be found desirable to constitute one piece of pipe or tube; the breadth of the strip, corresponding to the circumference of the tube intended to be formed.

The sides of the slips are then bent up by swages, or otherwise in the usual way, so as to bring the two edges as close together as possible.

This bent iron, or imperfect tube, is then introduced into a blast furnace, and when brought nearly into a state of fusion, is removed, and placed under a tilt hammer, for the purpose of welding the joint. The anvil, or the bolster fixed into the anvil upon which the tube is to be placed, has a semi-cylindrical groove formed in it, and the under side of the hammer has a corresponding groove. The imperfect tube is now slowly passed along under the tilt hammer, and by a succession of blows, the edges of the plate-iron become welded from end to end, and the tube rudely formed. The action of the tilt hammer is effected as usual; it vibrates upon pivots, and by the rotation of a wheel with projecting arms or cogs, which strike successively upon the end of the hammer, it is raised, and falling by its own gravity, produces the repetition of blows.

When the edges of the iron have been thus completely welded from end to end, the tube is to be again heated in a furnace as before, and then passed through a pair of grooved rollers. These rollers may have several circular grooves, suited to tubes of different diameters. The end of the tube, immediately as it comes out from between the rollers, is met by a conical or egg-shaped core, placed at the extremity of a stationary, horizontal rod, which egg-shaped core enters the open end of the tube, as it advances from between the rollers, and by sliding upon this core, the internal part, or bore of the tube, is formed to the exact diameter of the core, and rendered perfectly smooth; its external form, being determined by the grooved rollers.

The advantages which are proposed by this mode of manufacturing tubes and pipes, of wrought iron, for conveying gas, and other purposes, are, that the internal and external surfaces of the tubes will be perfectly cylindrical, and parallel to each other; and that the irregularities, occasionally arising from scales, and other obstructions, will be altogether avoided. The claim of invention, therefore, is not to be considered as resting in the implements used in the operation, which are not new in themselves, either in form or character; but in the mode of operating, which, as respects the formation of pipes and tubes of malleable iron, is new.

To CORNELIUS WHITEHOUSE, *of Wednesbury, in the county of Stafford, Whitesmith, for his invention of certain Improvements in manufacturing Tubes for Gas, and other purposes.*

The present patent is for improvements upon the above process, invented by a workman in the employ of Mr. James Russell, in whom, we understand, the interest of this patent is now become vested; Mr. James Russell is, therefore, the only manufacturer of these tubes.

The improvement consists in heating the pieces of iron of which such tubes are to be made, in a blast furnace, and immediately after withdrawing them from the furnace, passing them through swages, or other such instruments, in the following manner. First, provide a piece of flat iron, commonly called plough-plate iron, of a suitable substance, and width, according to the intended caliber of the tube; this piece is then prepared for welding, by being beat up on the sides, or, as it is commonly called, turned over, the edges meeting, or nearly so, and assuming the form of a long, cylindrical tube. This tube is then to be put into the fire and heated by a blast, and when the iron is upon the point of fusion, it is to be drawn out of the furnace by means of a chain attached to a draw-bench, and passed through a pair of dies of the size required; by which means, the edges of the iron will become welded together.

It is stated, that the process of welding these tubes, may be performed without the screw-press and dies above described, by employing a pair of pincers, in which a conical hole is made between the two chaps, for the tube to pass through; which will have a similar effect to the dies.

The superior quality of these tubes, compared to those made in the ordinary way, is stated to arise from the iron being considerably improved by the operation of the hollow fire, by which the heat is generally diffused through every part. The length of the pieces of tube thus made, is likewise an advantage, as by the above means, pipes or tubes may be made from two to eight feet long, in one piece; whereas, by the old modes, the lengths of tube cannot exceed four feet, without considerable difficulty, and consequently an increased expense. It is further stated, that the tubes are capable of resisting greater pressure, from the uniformity of the heat throughout, when they were welded; and lastly, that both their internal and external surfaces are rendered smooth, and greatly resemble drawn lead-pipes.